MTM

THE JOURNAL OF METHODS-TIME MEASUREMENT

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In This Issue . . . . .

MTM ASSOCIATION FOR STANDARDS AND RESEARCH

The Journal of Methods-Time Measurement is dedicated to the technical aspects, application developments and general news items concerning the advancement of MTM.

The Journal encompasses the fields of endeavor that were formerly publicized in the MTM Newsletter and MTM Bulletin.

The technical section of the Journal is concerned chiefly with recent research developments both from the established research program at the University of Michigan, Ann Arbor, Michigan, and from somewhat smaller allied projects being conducted throughout the Association membership.

New applications of MTM as well as refinements of established applications are presented in the Application Section to illustrate specific approaches to management problems that can be solved through the use of Methods-Time Measurement.

Current events in the lives of persons associated with MTM are described in the general news section.

The Editorial Staff welcomes contributions for all three sections described.

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THE JOURNAL OF METHODS-TIME MEASUREMENT

MTM ASSOCIATION FOR STANDARDS AND RESEARCH

THE JOURNAL OF METHODS-TIME MEASUREMENT

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Editor's Note:

The Association has tried in every way possible to check the veracity of material published in the Journal of Methods Time Measurement. However, the opinions of the authors are not necessarily the opinions of the Association. The Association, therefore, will not be held responsible for any liability which may develop from any material in this publication.

CODE OF ETHICAL PRACTICE

For Members Of The MTM Association For Standards And Research

A. PURPOSE

This code is approved by the Board of Directors to:

1. Define the practices which should be followed by members of the Association in order to maintain the reputation and dignity of Methods-Time Measurement.
2. Guarantee that only qualified people are privileged to practice this technique under the sponsorship of the MTM Association.

B. ETHICAL PRACTICES

As a condition of membership, all classes of members accept the following practices in letter where they are directly applicable and in their intent throughout.

1. Each Professional Member will use for MTM assignments only personnel who have been adequately trained by a member of the Association and accredited by the Association.
2. In the teaching and training in MTM, the members will conform to the course outlines and minimum times as established by the Association.
3. The source of the basic data and the original training material will be clearly acknowledged and announced.
4. Members will use the standard forms, and the format of MTM data, as issued and approved by the Association.
5. Any questions with respect to the validity of MTM data will be referred to the Association.
6. The members agree not to alter the MTM data without approval from the Association.
7. Members will make available to the Association, their findings as to the extended application of MTM when such information is not of a confidential nature. Any papers published by members will not claim Association sponsorship unless such approval is secured from the Association before publication.
8. Members will be receptive to suggestions for improvement of the technique from any responsible source. The members will clear suggestions and criticisms through the appropriate committee or through an officer of the Association so that such suggestions or criticisms will receive considered attention.
9. Members will cooperate fully in any projects where such cooperation is in the best interests of Methods-Time Measurement.
10. All members will be conservative in their statements—either oral or written—regarding Methods-Time Measurement, so as to avoid any suggestions of exaggeration as to its application or the results to be obtained by its use.

C. PROFESSIONAL CONDUCT

All members of the Association are, in turn, members of other professional and technical groups. The MTM Association embraces and incorporates in this section, the Code of Ethics of one of these Associations, the Association of Consulting Management Engineers. The following statements are directly applicable to the Professional Members, yet it is implied that the spirit and intent guide all the members of the Association.

1. In presenting to a prospective client our qualifications for undertaking a professional engagement, we will make only such representations and employ only such means as are consistent with the highest professional standards.
2. We will accept only such engagements as we are qualified to undertake, and will assign to a client's work only such personnel as are fitted to give effective service in the solution of the particular problems involved.
3. All information regarding a client's business and affairs which comes to us in the course of our professional engagement, we will regard as confidential and strictly so protect.
4. In exercising our professional responsibilities, we will maintain an objective and unbiased attitude, and will always be controlled by considerations of the best interests of the client.
5. We will endeavor to serve every client in such a manner that the product of our work will represent permanent benefits to the client. In striving for this result, we will always be at pains to supply the client's employees with adequate knowledge of the principles applied and techniques used, in order that suggested improvements may be most effectively administered by them after completion of our assignment.
6. We will always be guided in our work by complete and understanding acceptance of the preponderant importance of human relations; hence, we will so formulate our recommendations and prepare the way for their introduction, that we may legitimately expect to gain the substantial cooperation of all employees affected.
7. We will not disparage the work of professional colleagues.
8. We will always confine our financial arrangements with clients to reasonable fees or rates of charges agreed upon in advance of an engagement.
9. If we should at any time employ in our work, techniques which have been devised by and are generally accredited to colleagues, but are not, as yet in the domain of common knowledge, we will do so only with their permission and on condition that they be given due credit.
10. We will not accept fees, commissions, or any other valuable considerations from organizations, the use of whose equipment, supplies or services we may recommend to our clients.

D. DURATION

1. This Code is in effect and it will be adhered to by the members of the Association until such time as revision or further clarification is approved by the Board of Directors, in order to preserve or strengthen the intent of the Code.

TECHNICAL

REPORT ON THE USE OF MOTION TIME STUDY IN THE STUDY OF A WINDING OPERATION OF HOLTS FOSTER CONE WINDING MACHINES

From the Textile Industry in Lancashire, England

Bernard Crossley — Productivity Dept., Cotton Board. Manchester, England

INTRODUCTION

The main object of this investigation was to discover the reasons for differences in the normalised time value for an element of work on the Holts Foster Cone Winder. This machine was chosen as the subject of this investigation for three reasons:

a) Variation in time for the same element of work (i.e., walk and replace empty creel package with full package and piece up) in five mills is 0.20 normal minutes to 0.30 normal minutes (or 12 normal seconds to 18 normal seconds) for mule cop on short tube and ring tubes.

b) This element of work is 60% to 75% of the total work done in 45 hours.

c) A scrutiny of winding set-ups showed that an average reduction of 25% in the time taken to perform this element of work will give increases in the order of 10% to 20% in actual pounds of yarn produced per winder.

The report is divided into five parts:

A. Conclusions.
B. Collection of data.
C. Analysis of data.
D. Recommendations.
E. Comment.

A. CONCLUSIONS

1. Element studied. Walk and replace empty creel package with full package and piece up to cone using hand knotter.

Normal Times from a Survey on Holts Foster Coner

	MULE COP (SHORT TUBE)		RING TUBE	
MILL	Normal Minutes	Normal Seconds	Normal Minutes	Normal Seconds
A.	.30	18	.225	13.5
B.	.23	13.8	-	-
C.	.294	17.6	.242	14.5
D.	.296	17.8	.250	15.0
E.	.200	12.0	.200	12.0

F. Not work studied, but estimated times from motion pattern for ring tubes would be 0.22 normal minutes or 13.2 normal seconds.

(See Appendix II for winding speeds, machine details, counts, etc.)

A comparison of these times with the length of the motion pattern in each individual case is shown in Appendix I. The longest motion patterns at mill D compare with the longest times, i.e., (.296 N.M's. for mule cops and .250 for ring tubes). The shortest motion patterns at mill E compare with the shortest times, i.e., (.20 N.M's. for mule cop and ring tube).

The principal causes of these variations are:

a) Height of creel holder, or skewer, position of creel shelf or box.

b) Method used by individual operatives. This is effected partly by (a) above and partly by the method of finding the end on the cone; by the method of skewering, either by removing the skewer from the holder, or skewering the cop to a fixed skewer; and also in the method of disposal of empty packages.

2. Analysis of the same element of work in these mills on M, M2 and M86 type machines shows that it is possible to improve the method of operation for this element. This would give increased production for the same amount of effort by the operative.

3. To achieve this reduction, a modification to the height of skewer holder and creel store points would be necessary. This would reduce the operatives path of movement as shown in the machine sketch in Appendix III. It would be necessary to train the operatives to carry out the operation as seen at mill E, and as visualised from the synthetic motion pattern.

4. This investigation shows that for operations of a repetitive manual nature, a system of motion time study would be a useful and additional analytical technique for work study officers in textiles.

B. COLLECTION OF DATA

It was necessary to collect details concerning length, height, width of machine and distances from normal working positions to working points on the machine. Photographs and sketches of these ma-

chines were made. Differences between the same machines and types of machines are analysed in the next section of this report.

Textile operations are mostly carried on from walking and standing positions. These positions vary according to the width and spacing of machines, height of creels, height of operatives and variable positions in which operatives stand. A 36" flexible steel tape is used and by observing the operatives movements it is possible to gather approximate measurements to these working points in the first instance. The measurements are then checked by the observer trying out the motions and by observing and re-checking the measurements of each operatives path of movement of different machines. Once the observer has decided the standard average length of reaches and moves, he then proceeds to write down the details of the motion pattern.

C. ANALYSIS OF DATA

The table shows the measurements on the machine which effect the length and time of the motion path of the operative. (See opposite page.)

Comparison of motion patterns.
(Comments about some differences)

At mills A and D the creel box is fixed in front of the ring tubes' holders. The box at mill A is 25" from the floor, at mill D it is 18" from the floor. This causes the operative to bend when picking up a full package from a jumbled pile in the box. The pre-determined time for this motion at mill A is 73 units and at mill D 174 units. This is one cause of the variation in time.

At mill E and mill C the full creel packages are arranged on a shelf above the winding drums. At mill E the operative reaches 14" to the shelf and at mill C a 20" reach is made. The difference in length of reach is due to the method used by the operator. At mill C empty tubes are removed separately from a number of skewer holders and thrown to a skip in the alley. At mill E an empty tube is removed with the left hand to a box under the skewers and at the same time a full tube is positioned to the skewer. This alters the sequence of movements so that the operative reaches to full tubes on the shelf from the knotting position. The knotting position is between the clearer guides and the cone. At mill C the hand reaches for a full ring tube from a position level or below the clearers guides. The time for a 14" reach at mill E is 86 units and at mill C, 112 units for a 20" reach.

Another difference observed between operatives in the same mill and at other mills, is the method of finding the end on the cone.

Three methods have been observed.

a. Stop the cone and turn with three fingers on the left hand and pick off the end with the thumb and forefinger and at the same time the right hand completes the positioning of the yarn under the final clearer guide, and meets the end held in the left hand at the knotting position.

b. Stop the cone with the left hand after the yarn has been positioned under the guide with the right hand and pick off the end with the right hand and join the two ends over the knotter.

c. Stop the cone with the left hand and stroke the end from the cone with the right hand and join the two ends over the knotter.

Adoption of (a) above gives the shortest path of motion and takes the least amount of time.

When creeling mule cops, the general practice is to take out the skewer to skewer the full cop. This involves a number of transfer grasps of the skewer and cop. At two mills the cops are skewered directly to a fixed spindle. This accounts for the difference in time for ring tube creeling and cop skewering. At mill E the operatives have been specially trained to skewer mule cops to a fixed skewer, the normal minutes value is the same for ring tube or mule cop. At mill F mule cops are skewered to fixed skewers and we are told that these operatives are not especially trained to do this. The operatives at mill F have not been time studied, the estimated value from the motion pattern with additional allowance for walking is .22 normal minutes or 13 normal seconds.

It would not be practicable to skewer cops to a fixed skewer at mill C because they are bleached, and due to packing and repacking the cops are normally flattened at the cop nose.

In all cases the mule cops used were on short tubes.

D. RECOMMENDATIONS

1. Machine modifications.
   a. The base of all package holders or skewers should be at least 18" from the floor. This may involve raising the machine in some cases to ensure that the distance from the top of the package to the clearer guide is 8" - 10".

   b. If creel boxes are used, the top front edge of the box should be 25" from the floor. This will enable the operative to reach 6" without bending. If a shelf above the winding drum is used, the operative must be trained to reach for a full package from the knotting position, i.e., (14") to

HOLTS FOSTER CONE WINDER

Mill	Type of Package	Type of M/c.	Height of box or creel shelf from floor		Height of package. Holder from floor measured at base		Length of spdle or skewer	Tip of skewer to 1st clearer	Floor to guide	Guide to cone	Number of threading points through clearers
			H.	Distance Reached	H.	Distance Reached					
A	R.T.	M86	25"	6"	19"	10"	3"	8"	35"	16"	2
B	M.C.	M	56"	20"	15"	Bend(10")	8"	8"	31"	16"	2
C	R.T.	M2	53"	20"	15"	20"	8"	9"	34"	16"	3
D	R.T.	M86	18"	Bend(18")	18"	12"	8"	10"	36"	16"	2
D	M.C.	M86	18"	Bend(18")	18"	12"	8"	10"	36"	16"	2
E	M.C.	M2	52"	16"	15"	10"	8"	12"	31"	16"	3
E	R.T.	M2	52"	14"	15"	10"	8"	10"	31"	16"	2
F	R.T.	M86	52"	12"	20"	10"	6"	11"	37"	16"	2
F	M.C.	M2	53"	14"	19"	14"	8"	8"	35"	16"	2

Table showing work study values at each mill

MILL	Mule Cop (S.T.)		Ringtube		REMARKS
	N.M's.	N.S's.	N.M's.	N.S's.	
A	.30	18.0	.225	13.5	Empty tube to skip at rear.
B	.23	14.0	-	-	Remove skewer, reach with skewer for full cop. Drop empty tube on tray near floor.
C	.294	17.6	.242	14.5	Drop empty ring tube in skip alongside frame.
D	.296	17.8	.250	15.0	Remove skewer, place tube in overall pocket. Remove empty R.T. to pocket, then to skip at rear.
E	.200	12.0	.200	1.0	Skewer cop to fixed skewer, drop empty tube in box. Drop R.T. in box under spindle.
F	-	-	-	-	Skewer cop to fixed skewer, place empty tube in special apron pocket.

A study of these measurements without reference to the motion pattern used by operatives would not give the impression that wide differences in time values exist between mill and mill. Analysis and comparison of the motion patterns show the reason for these differences in time values.

meet this requirement the operative must remove one empty package with the left hand as the right hand positions the full package to the skewer.

c. Alternatively, it is suggested that a tray be substituted for the box and fixed in front of the skewer holder, the cops or tubes being laid on the tray and empty tubes dropped below the tray into light weight boxes situated at intervals along the frame under the creel tray.

2. Methods.

a. Operatives should be trained to turn the cone with three fingers of the left hand and pick off the end with the thumb and forefinger of the left hand, the right hand positioning the other end in the knotting position from the clearer guide.

b. Operatives should be trained to remove empty tubes with the left hand as the right hand positions a full package to the holder.

c. Operatives should be trained to skewer mule cops to a fixed skewer.

If recommendations 1(a), (c) and 2(a), (b), (c) are adopted, the estimated time is 0.18 normal minutes or 11 normal seconds. This includes time for walking. The average time to carry out this element of work is 0.25 normal minutes, the reduction in time would be 28%. This would give increases in lbs. produced of the order 10% to 20%.

E. COMMENT

The recommendations in the previous section are subject to discussion and experiment because to our knowledge no member firm has tried the method outlined in 1(c). The design of a tray in front of the spindle instead of a badly designed box, (in many instances situated at the wrong height for the operative), would in our opinion be preferable to a shelf above the cones. This is a comparison between two methods of storing packages on the machine. If this method is not tried out, an improvement in the time to carry out this element can still be made by retraining operatives to drop empty packages into small boxes in front of the machine and to position full packages to the creel holder at the same time. In mill E this is already done and the established time value is 0.20 N.M.'s.

We should point out also that if these better methods are adopted the time to carry out the element of "walk and piece" break will also be reduced. A study of this element has been made and the motion pattern is similar to the main part of the element considered in this report.

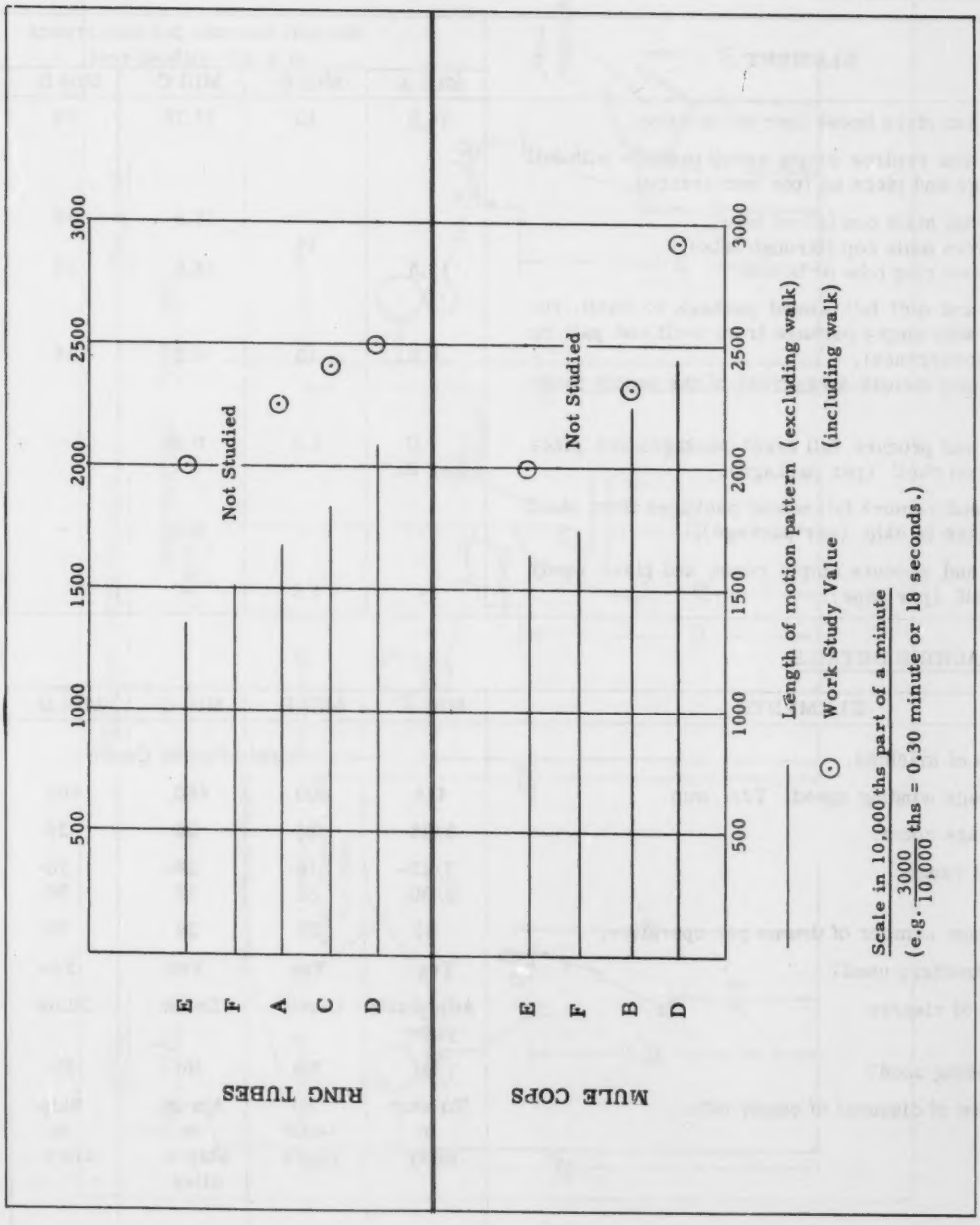
Appendices attached to this report.

I. Graph showing comparison of time values with motion patterns.

II. Details of counts, winding speeds, machine details and at mills A, B, C, D, E, (from Federation's survey).

III. Sketch of machine modification with tray, compared with two existing types.

APPENDIX I


RING TUBES
MULE COPS
E F A C D
E F B D
Not Studied
Not Studied
500 1000 1500 2000 2500 3000
Length of motion pattern (excluding walk)
Work Study Value (including walk)
Scale in 10,000ths part of a minute
(e.g. 3000/10,000 ths = 0.30 minute or 18 seconds.)

APPENDIX II

ELEMENT TIMES AND MACHINE DETAILS

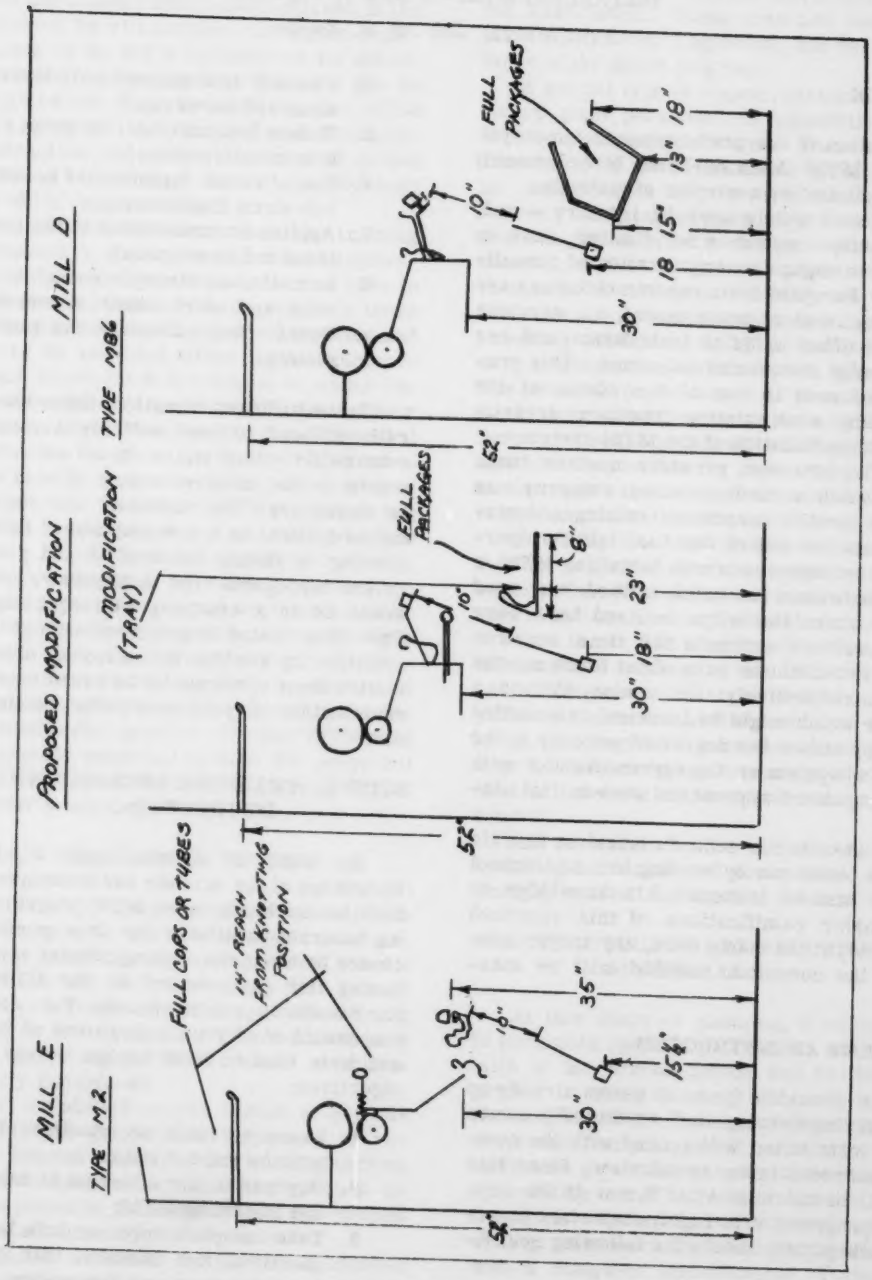
1. ELEMENT TIMES

ELEMENT	Normal seconds per occurrence at a '60' without rest.				
	Mill A	Mill B	Mill C	Mill D	Mill E
1. Walk and piece break (per occurrence).	14.5	10	13.75	12	11.80
2. Walk and replace empty creel package with full package and piece up (per occurrence).					
(a) from mule cop (short tube)			17.6	19	12.0
(b) from mule cop (through tube)		14			
(c) from ring tube or bobbin.	13.5		14.5	15	12.0
3. Walk and doff full wound package to shelf, replace with empty package from shelf and gait up (per occurrence). (Does not include a re-creel of the supply package)	6.5	15	9.2	15	-
4. Walk and procure full creel packages and place ready on shelf (per package).	7.0 per lb.	1.2	0.90	-	-
5. Walk and remove full wound packages from shelf and place in skip (per package).	-	-	9.50	-	2.80
6. Walk and procure empty cones and place ready on shelf (per cone).	-	1.5	-	-	1.40

2. MACHINE DETAILS

ELEMENTS	Mill A	Mill B	Mill C	Mill D	Mill E
1. Make of machine.	Holt's Foster Coner				
2. Average winding speed. Yds./min.	415	400	480	400	385
3. Average count.	2/26	24	36	24	42
4. Count range.	2/10-2/50	18-32	18-52	10-50	20-56
5. Average number of drums per operative.	25	25	28	30	45
6. Are knotters used?	Yes	Yes	Yes	Yes	Yes
7. Type of clearer.	Adjustable plate	Comb	Snick	Plate	Gate
8. Is waxing used?	No	No	No	No	No
9. Method of disposal of empty tube.	To skip in alley	To waist pouch	Apron, or skip in alley	Skip in alley	Box under cop jigger rail
10. Is skewer removed from cop jigger for skewering?	-	Yes	Yes	Yes	No

APPENDIX III



APPLICATION

INSTALLING MTM - A NEW APPROACH

F. H. Bayha and D. W. Karger

INTRODUCTION

An installation of the predetermined time system known as MTM (Methods-Time Measurement) may be accomplished by a number of methods.

A method most widely used by industry — and, the most effective means when limited time is available — is to engage an organization of consulting engineers. Provided their recommendations are implemented by an alert management, the services they offer will effect a quick installation and one which is generally successful and sound. This procedure was followed in one of the plants of the writers' company when existing conditions urgently dictated a rapid installation of the MTM system.

This article, however, presents another basic approach by which a medium-sized company can complete all essential personnel training and successfully initiate the use of this tool into its operations. Based on experience with installing MTM in two plants, one where the quick method was used and the other where the steps outlined here were followed, the authors estimate the time requirements for the two methods to be about three months and one year, respectively. Of course, this is a variable factor which might be lessened or exceeded considerably by either the degree of urgency in the need for such a system or the aggressiveness with which the management approaches such an installation plan.

The basic idea in the second method is to train one man in the technique by sending him to a school and then use him to transmit his knowledge to others. All major ramifications of this approach will be covered; at the same time, any major connection with the consultant method will be mentioned.

STEP I. SELECT AN INSTRUCTOR

Preference should be given to a man already on your Industrial Engineering staff, as this will insure that the final installation will accord with the company's best interests in the broad view. Since this individual will be the most vital factor in the success of your program, it is highly important to select one who adequately meets the following qualifications:

1. Is above average in intelligence.
2. Has an excellent personality.
3. Is competent to transmit his knowledge to others. Teaching experience and educational work are highly desirable in him.
4. Can sell intangibles to all levels of management and workers.
5. Reacts favorably to new ideas and can originate creative ideas.
6. Has a sound fundamental knowledge of good Industrial Engineering.
7. Applies common sense to his everyday problems and is practical.
8. Is motivated strongly enough to achieve success and work under stress without emotional complications — can please while insisting.

In the ordinary situation, these ideals are naturally difficult to meet entirely in your selection; a reasonable compromise based on actual requirements or the inherent nature of your company will be necessary. For example: the sixth attribute is not as critical in a company where Industrial Engineering is firmly entrenched and good leadership exists throughout the supervisory echelon as it would be in a company with opposing conditions. The other listed requirements might likewise be modified by similar factors; your instructor's selection must of necessity be based on an enlightened examination of your particular needs and limitations.

STEP II. TRAIN THE PROSPECTIVE INSTRUCTOR

He must, of course, gain a comprehensive knowledge of the science and technique involved before he can institute an MTM program. The training courses available for this purpose permit a choice between one lacking official approval and one having full endorsement by the MTM Association for Standards and Research. The author believes you should send your man to one of the latter type, and it is best to first assign to him the following objectives:

1. Learn as much as possible about the MTM science and technique.
2. Pay particular attention to details of selling and installing MTM.
3. Take complete notes on both lectures and all questions and answers that develop during class sessions and discussions.
4. Obtain the maximum amount of class pass-out material and teaching aids, or record the available sources for them.

An individual who was properly selected will

complete his training course successfully and you will now have on your staff a trained MTM application engineer. If the course was an approved one, and he passed the official examination offered at the end of the course, he will possess the highly desirable recognition of the MTM Association for Standards and Research in the work he does for you as an MTM Application Engineer. During the MTM Association's required one hundred and five (105) hours of instruction and a small amount of guided application work, he will have received a thorough grounding in MTM fundamentals.

You must realize, however, that his training needs supplementary experience in actual application practice to insure his competence, and also to instill confidence in himself and respect from those he is to teach. His additional practical training and experience can be provided either by the guidance of a consultant hired for a few weeks or under the close supervision of a responsible official in your Industrial Engineering Department. It is suggested that your instructor be given the dual assignment of making MTM checks on your existing standard data and of making a wide variety of MTM studies in the plant, which he then verifies by conventional time study methods. All of this work should be critically reviewed by the manager of your Standards Section. Your Standards supervisor should also assign some of the MTM studies for time study check by other members of his Industrial Engineering staff. Besides creating interest and building confidence in the procedure, this strategy will collect for the instructor a considerable quantity of actual MTM data which is absolutely essential to both the projected training courses and complete MTM Association approval of your program.

STEP III. PLAN THE TRAINING COURSES

Concurrently with the work outlined above which will provide experience for the newly trained instructor, policy decisions pertaining to the overall training program can be made. This will permit the instructor to proceed with the specific planning of the training he is to provide. Two basic types of courses tailored to the particular class membership are usually considered.

Ordinarily, a detailed course aimed at providing additional MTM Application Engineers is required and is limited to the Industrial Engineering personnel. The objective here is to duplicate as completely as possible the same scope and content of training as that taken by your instructor.

Such a course should be taught in a manner closely resembling a college level course in applied engineering, and formal proof of competence by testing or other means should be required of the enrollees. At the end of such a course, we issued a company diploma; and when we received certification of our training by the MTM Association later, as discussed below, those who successfully completed the course also took the approved examination to achieve recognition and approval cards from the Association. These men are then certified as MTM Application Engineers, and will form the task force of the MTM program.

A second type of course, designed for the supervisory plant personnel, is generally known as an MTM Appreciation Course. There can be no endorsement by the MTM Association and, therefore, no performance requirement from them in this course. The general knowledge of the basic science and simplified MTM techniques provided the men, however, will be of distinct value to them and to the company. It will pave the way on the production floor for acceptance of this new technique. Their resulting confidence in MTM results will be necessary to reap the greatest benefit from the program. The ease of cooperation with your Industrial Engineers in production problems will be enhanced if they can discuss standards intelligently together. It will also be possible for supervisors thus trained to make rough comparisons of several manual methods being considered as alternatives.

Probably the best result of such a course will be the increased methods-consciousness of your supervision, with attendant work simplification and cost reduction accomplishments by those most able to cause them. The course will obviously be a short one confined mainly to the MTM Simplified Data, and will thus be similar to Methods and Work Simplification courses already common in all industry today. The degree of competence and general knowledge already existing in your production supervision will determine the need and urgency for this course.

All pertinent details of both types of training, including schedules and such, should be decided and planned in detail during this phase of installation.

STEP IV. DEVELOP ALL REQUIRED COURSE MATERIALS

At this stage of planning, it becomes essential to formulate specific procedures and the factual details of the course content and to finalize these in printed or other form. This work will constitute the tangible evidence of your training program, its scope and competence. It is recommended that attention be given at all times to the requirements for approval by the MTM Association for Standards and Research. While this is discussed in STEP VI, it is well to state here that this group will provide you with a complete specification of course requirements and content without charge. This not only aids conformance for future approval but also saves some time in the immediate task of development.

The required course materials include:

(1) a training manual,

(2) class charts,
(3) class passout sheets,
(4) visual aids such as, motion pictures and objects,
(5) supplies of MTM working forms,
(6) student participation materials, such as, motion demonstration kits, and, of course,
(7) MTM textbooks.

A basic question which must now be decided is: Shall we buy them or should we develop and adapt our own? The information below will help your analysis of this matter. However, first let us mention that all of these things must be correlated into a course outline which shows in ample detail the content, lesson plans with time basis, procedural steps, usage made of the materials listed above, and topic outline of the points of emphasis. This outline is the official evidence of your training procedure and reveals the ability of the instructor. It will be a vital factor in MTM Association approval.

Obviously, certain of the materials must of necessity be purchased or rented. Items (4), (5), (6), and (7) above are furnished by regular sources which the instructor should have noted during his initial training. Requisition of these items should be made well in advance of needed dates so that classes will not be lacking them at the optimum point of usage. The class passout sheets (Item 3) can be obtained most economically by utilizing the reproduction methods available in the company. Generally the material obtained by the instructor can be adapted and its value increased to your company by editing it to best fit the training plans and individual problems involved. These, however, may also be purchased in standardized form if it appears advisable or desirable.

Remember at all times that your instructor will gain competence and confidence during any time he devotes to the work of developing his own materials. This applies also to the class charts (Item 2) for which the authors know no purchase source.

The course outline (Item 1) generally must be your own, guided by the MTM Association content stipulations; however, some consultants include such outlines with their training manuals, at a package price. The training manual is of such importance as to merit separate discussion below.

STEP V. OBTAIN OR DEVELOP A TRAINING MANUAL

This step involves a number of considerations of prime importance to the success of your entire MTM program, as a good manual must perform multiple duty not confined to training alone.

Characteristic features which the manual must possess are mainly dependent on the fact that the MTM technique, being relatively new, is a dynamic workstudy procedure. It is constantly being developed and extended to accord with new, continuing research by the MTM Association and others. The fact that this does occur and that research results are available for purchase at nominal cost is one of the outstanding assets of this particular predetermined time system.

A manual provides an absolutely necessary supplement to the MTM textbook, which is outdated by lack of revision to assimilate MTM advancements not yet available at its printing date. It is understood that this revision is scheduled. The manual must contain concise, accurate, and crystal clear examples to be practical. It also provides for including special information which can be found nowhere in printed form, but which exists in a good set of instructor's notes or is possessed only by very experienced Application Engineers from their intimate MTM experiences. A manual should also be flexible in format to facilitate ease in revision due to new data by yourself of the MTM Association.

Information sources for the data contained in the MTM manual are so diverse that the compilation of the data into manual form is a facet in your MTM program that is hard to evaluate in terms of time and cold money. Some of the major sources of information are: MTM textbook itself; notes and experiences of the instructor; MTM Newsletters; MTM Bulletins; MTM Research Reports; critiques by the MTM Association of your training materials and your evaluations of researches when submitted; and the printed Proceedings and other materials you can obtain at MTM Conferences and, in fact, any capably conducted conference in management or Industrial Engineering.

Several questions are also involved in the construction of the manual. Should it meet your own needs alone, or should it also conform to MTM Association requirements to permit their approval?

Another question of prime importance is whether it is intended purely for training, or do you wish to gain the advantage of a reference type manual? In the latter case, it will serve better as an operating reference; and to aid this usage, it should be written in topic outline fashion with indexed tabs. A reference type also is more adaptable to publicizing revised materials that might mean real money savings in your work measurement problems. Will the manual be for instructor service only, or will it be a type permitting distribution to each student so that they can own an authoritative source of MTM information? This answer will likewise affect the format and what the manual includes, since purely instructional data and reference examples do not belong in distributed manuals.

All of the above discussion is given to show the kind of decision you must make in obtaining an MTM manual. There are two approaches, either purchase of a consultant's manual or development of your own. At the date of writing of this article, only

three firms of consultant engineers have developed approved MTM training manuals. It is believed that these are all basically aimed at filling the instructors' needs. The writer's company is the only industrial firm with an internally developed MTM manual having MTM Association approval. It is of the operating reference type and aimed at the student. Each student of the detailed course is given a manual to encourage sound MTM practice.

The pros and cons of purchasing or developing a manual revolve around all of the implications above plus several more direct considerations. Obviously, it is much quicker to purchase a manual, with the advantage of prior approval and lower first cost. However, the cost of purchased manuals would be prohibitive for most companies should copies be purchased for many students. Developing your own manual will,

(1) assure that your instructor has a firm grasp of the fundamentals, since he could not otherwise devise a manual, particularly one qualifying for Association approval, and,

(2) permit your own peculiar needs and training plans the maximum of consideration.

With all of these factors included, you can make an intelligent choice.

STEP VI. OBTAIN MTM ASSOCIATION APPROVAL

To this point, it has been implied that you will agree with the authors that such approval is most desirable. However, the title of this section is in the candid form because your actual decision must be dictated by the pros and cons inherent in your own situation.

If you have deferred this question while completing the previous installation steps, it must now be faced. The writer's firm was the first industry to gain MTM Association approval for its own course development.

You can obviously obtain good and entirely satisfactory results without this approval, since many firms have conducted internal training and successfully used MTM without approval.

Securing the approval, however, protects your investment in this valuable managerial technique by

(1) insuring that you are providing adequate and correct training for your personnel,

(2) permitting them to take the approved exam to achieve personal recognition from the MTM Association,

(3) serving to mutually benefit your personnel and your company by their professional advancement,

(4) giving evidence of your calibre and integrity to those most qualified to help you,

(5) instilling management's faith in your endeavor, and

(6) giving the assurance essential to any dynamic enterprise that your new system will not lose effectiveness due to loss of required maintenance or lack of vital information.

Securing approval will involve some additional cost and effort. Official action on your application will not be taken until you become a Sustaining Member of the MTM Association. Since they automatically fulfill requirements, the problem of approval is simple for purchased manuals and course outlines. If you develop your own manual and course, their approval is contingent upon your making any required changes after submission to the MTM Association. Full approval of your MTM program also means that your instructor must be personally approved by an Association examining committee of approved instructors. This involves an all day oral and written test which includes the submission and analysis of MTM studies your instructor has made in your plant as evidence of proficiency. The instructor's successful completion of the professional requirements will result in the recognition of him as a REGISTERED COMPANY INSTRUCTOR. This will assure that he is well qualified to present MTM to your staff, perform his vital function in implementing your program, and it will also be the final stamp of approval by the MTM Association of your company plans.

STEP VII. START AND CONDUCT YOUR TRAINING

The manner of initiating the courses is highly important, indeed it is worthy of the participation of a high company official. His prestige should be given to divulging the company plans and policies in the new program, describing all the efforts presented above, and introducing the instructor to the class with proper approbation. All of the procedures normally associated with good psychology and human relations are vital here.

With such auspicious beginnings, you should find it relatively easy to carry all of your plans to completion with but minor difficulties. A pleasant surprise awaits you in the enthusiasm and interest which will be generated. Be sure to capitalize this to the utmost, and you will find that the success of your MTM program will more than justify the time and effort spent in so much preparation and attention to detail. Higher morale and methods consciousness alone will produce both intangible and tangible savings you had previously not anticipated. This has been the experience of many firms.

MTM INSTALLATION FLOW CHART

Steps to Take	Summary of Factors
I. Select an instructor	A. Personal attributes desired in him. B. Practical choice based on actual conditions.
II. Train the instructor	A. Send him to reliable training course. B. Assign specific objectives to attain. C. Qualify him as MTM Application Engineer. D. Provide guided application and experience.
III. Plan the training courses	A. Make policy decisions, specific plans. B. Plan Detailed Course for Application Engineers. C. Plan Appreciation Course for supervision.
IV. Develop course materials	A. Use MTM Association requirements as guide. B. Purchase or develop teaching aids. C. Prepare detailed course outline.
V. Obtain or make a training manual	A. Consult all available information sources. B. Determine usage to be made of manual. C. Decide what is desired in a manual. D. Analyze the cost question involved.
VI. Secure MTM Association approval	A. Base decision on factors listed. B. Join as Sustaining Member. C. Obtain approval of course and plans. D. Qualify the instructor.
VII. Initiate MTM training courses	A. Human relations should govern actions. B. Manner of introduction is important. C. Training results will justify plans.
Complete the Installation and Maintain	A. Use consultants when advisable. B. Assure proper MTM technique usage. C. Do not permit system to deteriorate.

RESULT: Profitable benefits of scientific management.

CONSULTANT SERVICES

This presentation would be incomplete without mention of the value of engineering consultants in MTM programs. Allusion to this in the introduction was very brief and should be amplified.

The services of an MTM Association approved consultant will provide training of the highest calibre which will automatically carry approval for your own MTM program. He will not only administer the approved examination to your trainees, but will generally provide better guided application for them than your own instructor is initially capable of doing. Since this will be done on your own problems, concurrent benefits such as methods improvements will accrue from the consultant's broader knowledge and experience. Oftentimes, he can save training time and expense for you by conducting the Application Training and MTM Appreciation courses simultaneously, which may speed your usage phase of the MTM installation. He can also help you provide for carrying on your future training plans by helping you to select, train, and qualify your own instructor. This would mean concentration on this problem by a person qualified to provide the best solution. In short, entire reliance on the consultant's services may well be your best means of installing MTM.

The appraisal just given does not in any way lessen the previous arguments as to the merit of designing and installing the MTM system yourself. In fact, it is but frank recognition where due that the original method of installing MTM has been done well by consultants in the past.

It also emphasizes that the approach of this article is really new, since it has been shown that the writer's company has pioneered in internal installation. And finally, it provides an opportunity to state that a policy of cooperation with consultants, availing yourself at their aid in all aspects of your own program where wisdom dictates such services, should be included as part of your basic attitude in utilizing this new approach to the installation of MTM.

* *** *

MTM in a traditionally Day Work department

A recent application of MTM to the Cutting Room in an upholstered furniture factory, The Berkline Corporation, Morristown, Tennessee, has resulted in savings far exceeding the installation cost. It is significant that cutting of fabrics is traditionally a "daywork" operation in Needle Trades and upholstered furniture operations. The installation should be of significance to all people having to face the problem of cost reduction in this type of activity.

The study was made as a training project by three men who had just completed an "in plant" approved course of instruction — under the guidance of a consultant professional member of the MTM Association for Standards and Research. No accurate estimate of man hours of study can be made, since they carried on their regular departmental duties at the same time.

As a first step, the cutting work was broken down into three classes. These were:

1. Cutter - performs all the cutting of extensive variety of fabrics.

2. Spreader - spreads different covers and colors according to customer orders for a given style chair and does all necessary preparation work before the spread of a number of layers is cut.

3. Make-up - assembles all pieces of a given part of chair such as arms, back, seat, etc., and ties them in bundles to be sent to sewing room. Does all necessary work to identify pieces for particular style.

This reduced the mental requirements and allowed the men to become more proficient at specialized tasks.

It was found expedient to time by stopwatch only the controlled cutting motions. Otherwise, MTM was used throughout. The following table gives an idea of the extent to which MTM was used.

Job	% total work	% MTM	% Time study	Overall % MTM
Cutting	20	40	60	8%
Spreading	40	100	--	40%
Make-up	40	100	--	40%
				88%

As a result of this installation a production increase of over 100% per man hour was obtained. This represents an annual savings of an estimated $25,000, possibly more.

A standard for any "marker" can be established in less than 15 minutes.

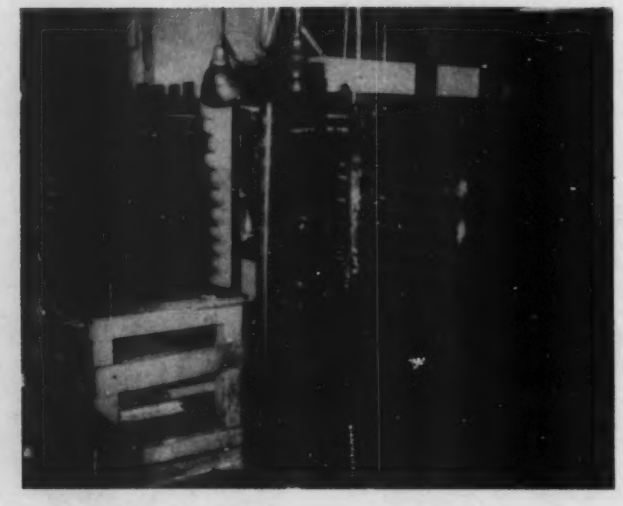
Workers earnings have averaged, in most cases, 20% over standard. Mr. Lester Popkin, General Manager, says that cost of training and application was covered several times over by yearly savings in this one department.

* *** *

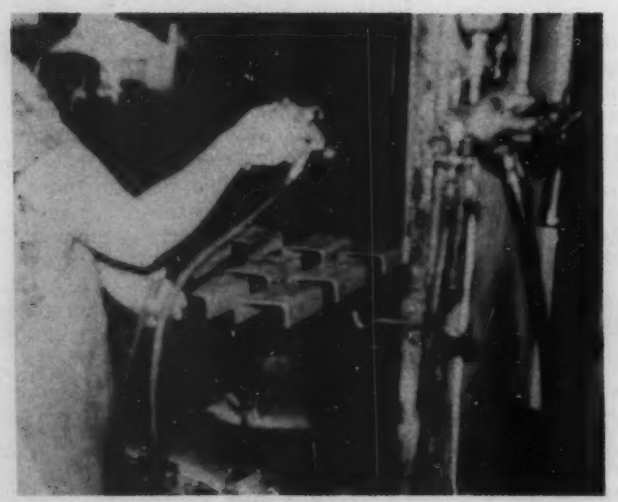
AN ANALYSIS OF SPRAY-PAINTING

C. G. Downen

An interesting application of MTM is to be found in spray-painting of metal racks. The following photos, description, and analysis are presented as an approach to this type of operation.



Typical Rack Set-up



Spray Operation

PART NAME Cover PART NO. ____ DEPT. ____

OPERATION NAME Spray Black Paint on Case OPER. NO. 1 DATE ____

ANALYST: CGD APPROVED: ____

ACTIVITY ____ PER ____

EQUIPMENT: Spray Booth
Spray Gun

TOOLS:
22" x 24" Mesh Tray

MATERIALS:
Steel

MTL. HANDLING: ____

SAFETY: ____

QUALITY:
No spots or bubbles after Paint is baked on.

RELATED ANALYSES: ____

REMARKS:
Location:
Spray Booth #1
Section #1308

SKETCH OF WORK PLACE, WITH DIMENSIONS

SKETCH OF PARTS, TOOLS, ETC., WITH DIMENSIONS

ELEMENT	DESCRIPTION	TMU REQUIRED	LEVELED TIME	% ALLOWANCE	TIME PLUS ALLOWANCE	OCC. PER CYCLE	TOTAL TIME REQ.
1	Spray Inside of Cover (9/tray)	829.5	.008295	16	.009620	1/9	.001068
2	Spray Outside of Cover (9/tray)	1192.8	.011928	16	.013836	1/9	.001537
3	Move Truck for Loading 2nd tier.	112.8	.001128	16	.001310	1/126	.000010
4	Aside Loaded Truck and Get Empty.	441.8	.004418	16	.005120	1/252	.000020
ALLOWED TIME	TOTALS						.002635

FORM NO. MTM-6

SHEET ____ OF ____ SHEETS

APPLICATION

MTM ELEMENT ANALYSIS

PART Cover 16-0223 PART NO. _____ DEPT. _____
OPERATION Spray with Black Paint DATE 1-5-54

DESCRIPTION — LEFT HAND	*	MOTION	TMU	MOTION	*	DESCRIPTION — RIGHT HAND
(1) Spray Inside of Cover (9 per tray)						
			34.1	SS1202		Side step to supply.
Reach to tray.		R12B	12.9	R12B		Reach to tray.
Grasp tray.		G1A	1.7	G1A		Grasp tray.
Raise tray.		M8B	10.6	M8B		Raise tray.
			15.0	W1P		Step back one pace.
			37.2	TBC2)		
			18.6	TBC1)		Turn body 180°.
			15.0	W1P		Step one pace forward.
Move tray to turn table.		M8B	10.6	M8B		Move tray to turn table.
Release tray to turn table.		RL1	1.7	RL1		Release tray to turn table.
			9.6	R12A		Reach to gun.
			1.7	G1A		Grasp gun.
Reach to gun hose.		(R12B)	13.4	M12B		Pick up gun.
Grasp hose.		G1A	1.7			
Raise hose to clear tray.		M12B	13.4	M12B		Move gun into position.
(Hold hose in hand)			10.6	AP2		Squeeze trigger.
			94.8	M16B	6	Move to right to spray.
Release hose.		(RL1)	94.8	M16B	6	Move to left to spray.
Reach to corner of tray.		R14B	14.4			
Contact tray to push.		G5	0			
Push tray to swing 180°.		M6Bm	5.7			
Release tray.		RL2	0			
Move hand back to stop tray.		R6E	8.0			
Grasp tray to stop.		G1A	1.7			
Release tray.		RL1	1.7			
Reach to gun hose.		R10B	11.5			
Grasp hose.		G1A	1.7			
Raise hose to clear tray.		M12B	13.4	M12B		Move gun in position.
			10.6	AP2		Squeeze trigger.

* = LIMITING MOTION

SHEET 1 OF ____ SHEET

MTM ELEMENT ANALYSIS

PART _____ PART NO. _____ DEPT. _____
OPERATION Spray with Black Paint DATE _____

DESCRIPTION — LEFT HAND	*	MOTION	TMU	MOTION	*	DESCRIPTION — RIGHT HAND
			94.8	M16B	6	Move gun to right to spray.
			94.8	M16B	6	Move gun to left to spray.
Reach to corner of tray.		(M14B)	15.2	M12C		Move gun to hook.
Grasp tray.		(G1A)	5.6	P1SE		Place gun on hook.
			1.7	RL1		Release gun.
			12.9	R14B		Reach to tray.
			1.7	G1A		Grasp tray.
Lift tray.		M8B	10.6	M8B		Lift tray.
			15.0	W1P		Step back one pace.
			74.4	TBC2	2	Turn body 180°.
Move tray to table.		M22C	23.8	M22B		Move tray to table.
Place on stack of trays.		P1SD	11.2	P1SD		Place on stack of trays.
Release tray.		RL1	1.7	RL1		Release tray.
			829.5			
(2) Spray Outside of Cover						
Reach to tray.		R12B	12.9	R12B		Reach to tray.
Grasp tray.		G1A	1.7	G1A		Grasp tray.
Raise tray.		M8B	10.6	M8B		Raise tray.
			15.0	W1P		Step back one pace.
			37.2	TBC2)		
			18.6	TBC1)		Turn body 180°.
			15.0	W1P		Step one pace forward.
Move tray to turn table.		M8B	10.6	M8B		Move tray to turn table.
Release tray to turn table.		RL1	1.7	RL1		Release tray to turn table.
			9.6	R12A		Reach to gun.
			1.7	G1A		Grasp gun.
Reach to gun hose.		(R12B)	13.4	M12B		Pick up gun.
Grasp hose.		G1A	1.7			
Raise hose to clear tray.		M12B	13.4	M12B		Move gun into position.
			10.6	AP2		Squeeze trigger.

* = LIMITING MOTION

SHEET 2 OF ____ SHEET

MTM ELEMENT ANALYSIS

PART _____ PART NO. _____ DEPT. _____
OPERATION Spray With Black Paint DATE _____

DESCRIPTION — LEFT HAND	*	MOTION	TMU	MOTION	*	DESCRIPTION — RIGHT HAND
			47.4	M16B	3	Move gun to left to spray.
			47.4	M16B	3	Move gun to right to spray.
Release hose.		RL1	1.7			
Reach to corner of tray.		R14B	14.4			
Contact tray to push.		G5	0			
Move tray to swing 90°.		M6Bm	5.7			
Release tray.		RL2	0			
Move hand back to stop tray.		R6E	8.0			
Grasp tray to stop.		G1A	1.7			
Release tray.		RL1	1.7			
Reach to gun hose.		R10B	11.5			
Grasp hose.		G1A	1.7			
Raise hose to clear tray.		M12B	13.4	M12B		Move gun to position.
			10.6	AP2		Squeeze trigger.
			94.8	M16B	6	Move gun to right to spray.
			79.0	M16B	5	Move gun to left to spray.
Release hose.		RL1	1.7			
Reach to corner of tray.		R14B	14.4			
Contact tray to push.		G5	0			
Move tray to swing 90°.		M6Bm	5.7			
Release tray.		RL2	0			
Move hand back to stop tray.		R6E	8.0			
Grasp tray to stop.		G1A	1.7			
Release tray.		RL1	1.7			
Reach to gun hose.		R10B	11.5			
Grasp hose.		G1A	1.7			
Raise hose to clear tray.		M12B	13.4	M12B		Move gun to position.
			10.6	AP2		Squeeze trigger on gun.
			47.4	M16B	3	Move gun to left to spray.
			47.4	M16B	3	Move gun to right to spray.
Release hose.		RL1	1.7			

* = LIMITING MOTION

SHEET 3 OF ____ SHEET

MTM ELEMENT ANALYSIS

PART _____ PART NO. _____ DEPT. _____

OPERATION Spray With Black Paint DATE _____

DESCRIPTION — LEFT HAND	*	MOTION	TMU	MOTION	*	DESCRIPTION — RIGHT HAND
Reach to corner of tray.		M14B	14.6			
Contact tray to push.		G5	0			
Move tray to swing 90°.		M6Bm	5.7			
Release tray.		RL2	0			
Move hand back to stop tray.		R6E	8.0			
Grasp tray to stop.		G1A	1.7			
Release tray.		RL1	1.7			
Reach to gun hose.		R10B	11.5			
Grasp hose.		G1A	1.7			
Raise hose to clear tray.		M12B	13.4	M12B		Move gun to position.
			10.6	AP2		Squeeze trigger.
			110.6	M16B	7	Move gun to left to spray.
			94.8	M16B	6	Move gun to right to spray.
Move hand to tray.		(M14B)	15.2	M12C		Move gun to hook.
Grasp tray.		(G1A)	5.6	P1SE		Place gun on hook.
			1.7	RL1		Release gun.
			12.9	R14B		Reach to tray.
			1.7	G1A		Grasp tray.
Lift tray.		M8B	10.6	M8B		Lift tray.
			37.2	TBC2		Turn body 90°.
			30.0	W2P		Walk two paces.
Move tray to truck.		M12C	15.2	M12C		Move tray to truck.
Place leading edge of tray in guide.		P2NSD	26.6	P2NSD		Place leading edge of tray in guide.
Push tray into position.		M16B	15.8	M16B		Push tray into position.
Transfer grasp.		G2	5.6	G2		Regrasp.
Push tray into place.		M4B	6.9	M4B		Push tray into place.
Release tray.		RL1	1.7	RL1		Release tray.
			15.0	W1P		Step back one pace.
			37.2	TBC2		Turn 90° to supply.
			1192.8			

* = LIMITING MOTION

SHEET 4 OF ____ SHEET

MTM ELEMENT ANALYSIS

PART _____ PART NO. _____ DEPT. _____
OPERATION Spray With Black Paint DATE _____

DESCRIPTION — LEFT HAND	*	MOTION	TMU	MOTION	*	DESCRIPTION — RIGHT HAND
(3) Move truck into position for loading second tier (1/294 occ.)						
Reach to truck.		R12B	12.9	R12B		Reach to truck.
Grasp truck.		G1A	1.7	G1A		Grasp truck.
			37.2	TBC2		Turn body 90°.
Push truck 22".		M22B30	22.1	M22B30		Push truck 22".
Release truck.		RL1	1.7	RL1		Release truck.
			37.2	TBC2		Turn body 90°.
			112.8			
(4) Move fully loaded truck aside and move empty truck up.						
Reach to truck.		R12B	12.9	R12B		Reach to truck.
Grasp truck.		G1A	1.7	G1A		Grasp truck.
			30.0	W2P		Push end of truck 90° arc.
			37.2	TBC2		Turn body 90°.
Grasp truck.		G1A	1.7	G1A		Grasp truck.
			60.0	W4P		Push truck aside toward oven
Release truck.		RL1	1.7	RL1		Release truck.
			37.2	TBC2		Turn body 90°.
			30.0	W2P		Walk to empty truck.
Reach to truck		R12B	12.9	R12B		Reach to truck.
Grasp truck.		G1A	1.7	G1A		Grasp truck.
			30.0	W2P		Move truck to position.
Release truck.		RL1	1.7	RL1		Release truck.
			17.0	SS12C1		Side step.
			60.0	W4P		Walk 4 paces to work station
			441.0			

* = LIMITING MOTION

SHEET 5 OF 5 SHEET

UNION ACCEPTANCE OF MTM

Clifton Ellis

The attitude of organized Labor toward MTM is a much debated question. In general the acceptance by rank and file Union membership has been good. But few Labor groups have been willing to give any official "blessing" to the new technique.

One of the few endorsements — by well established old line Unions — was made here at the Capacitor Plant of Sangamo Electric Company, Marion, Illinois. Our Union, the International Association of Machinists (A.F. of L.) voted unanimously to accept MTM — in open meeting — last August.

The conditions leading to this decision may be of interest. Over a period of several years — during which time our plant was moved here from Springfield, Illinois — certain inequities and inconsistencies had crept into our Incentive Plan. This is, of course, not unusual.

Our Management, and our Union, were definitely unhappy with this condition. The Union was about ready to reject any incentive plan. Management recognized, too, the urgent need for something better. It was agreed that the old procedure could not be revised satisfactorily.

We recognized the importance of full Labor-Management cooperation in developing a better plan. Accordingly, we were glad to work with our Shop Committee and the International's District Representative, Mr. Russell Lovelace.

Several of the new techniques were investigated. MTM was selected as most likely to succeed. We considered the advice of experts essential to this success, so we enlisted the aid of well-known consultants to introduce an entirely new incentive plan.

The first thing we did was fully publicize MTM. It was important that our Union Members have an active part in the program through their stewards and officers.

Accordingly, we conducted short but complete courses in MTM for all supervisory personnel and Union representatives. These courses were designed not only to explain the technical details of MTM but — what is equally important — to show just how it would be used as a rate setting tool on various operations.

Of course, our Industrial Engineers were fully trained in MTM.

We published full information about the proposed new Incentive Plan. We discussed every phase of it with Mr. Lovelace and other Union Representatives reaching agreement on all points.

It is worth mentioning here that there was full realization that some drastic changes in Incentive Standards would occur. Many changes would yield only slight pay increases.

The new Plan would benefit the majority of Employees. However, minority groups — enjoying certain privileges under the old procedure — were expected to take a negative view of the new procedure.

At this point in the program, the proposed, MTM-based, Incentive Plan was presented to Union Members — by their representatives — in open meeting. Their vote was unanimously in favor of adopting MTM and the proposed Incentive Plan.

The use of MTM for rate setting is now a year old in this plant. Results have been unusually satisfactory to both Labor and Management.

Employee Relations are very much better. Our Personnel Manager, Mr. George Carty, states "It's the best thing we've ever done."

Not the least important factor contributing to happy relations is the reduction of human-judgement-errors in setting rates.

During our year's use of MTM two grievances regarding rates have been filed. In both cases discussions with Union Representatives centered around factual information — not opinions.

We are ready and willing to adjust Incentive Standards — our aim being equal earning opportunity for all employees. One of the grievances mentioned above resulted in such adjustment. In the other case we were able to show the Union the accuracy of the standards.

But more important than our willingness to adjust standards to changing conditions — is the ease of doing so — a facility inherent in the MTM technique.

Needless to say, the MTM technique coupled with Methods Engineering has produced substantial cost reductions. Production quota increases have frequently been as high as 45% to 65%.

After a full year's use of MTM we are confident that here is a technique of perennial benefits. Both Union and Management subscribe to this opinion.

MTM NEWS

REPORT ON THE STATUS OF MTM TRAINING PROGRAMS

A survey of the training courses sponsored by the Professional Members of the MTM Association was made to ascertain the extent to which the members were complying with prescribed regulations governing training programs.

The following is a summary of the information contained in the survey:

1. All of the Professional Member firms utilize an Association approved training manual in MTM Application Courses.

2. All application courses so conducted contain a minimum of 105 supervised, classroom hours of instruction.

3. The Executive Secretary of the Association is given advance notice of all approved courses, with respect to location, date of course, etc.

4. The approved data card is utilized in the teaching of MTM in all approved training courses.

5. The survey disclosed that 89 qualified instructors, licensed by the Association were teaching MTM in the approved or appreciation courses. Twenty-four additional persons were in some stage of the processing to become licensed teachers of MTM.

The Professional Member Survey has shown conclusively that the Association teaching regulations are being complied with and that the high standards prescribed by the Association in training individuals in the principles and applications of MTM are being upheld.

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A TMU WATCH

Recently, a producer of industrial stopwatches designed a special watch that reads directly in TMU's. The dial of the watch is divided into one hundred parts each representing .036 seconds or one TMU.

This design provides a rapid and convenient method of verifying one or a series of element values without conversion.

ORDER BLANK – REMITTANCE SHOULD ACCOMPANY SMALL ORDERS

Reports	Quantity	Unit Price		Extensions
		Member	Non-member	
101 Disengage		.75	1.00	
102 Reading Operations		.50	.75	
104 Performance Rating System		.50	.75	
105 Simultaneous Motions		1.00	1.25	
106 Short Reaches and Moves		1.00	1.25	
Proceedings 1952 MTM Conference		2.00	2.00	
Proceedings 1953 MTM Conference		4.00	5.00	
Data Cards				
Detailed Paper				
Simplified (paper)				
			TOTAL	

NAME _____ PLEASE SEND BILL _____

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Send order to: MTM Association for Standards and Research, 531 East Liberty Street, Ann Arbor, Mich.

RESEARCH REPORTS

Disengage (Report 101)

This report contains a preliminary study of the element disengage. While it is still classified as tentative, the report contains some extremely interesting conclusions on the nature and theory of this element.

Reading Operations (Report 102)

The first step in the use of MTM for establishing reading time standards is contained in this report. In addition, the report contains a synopsis of the work done in this field by 11 leading authorities.

MTM Analysis of Performance Rating Systems (Report 104)

A talk presented at the SAM - ASME Time and Motion Study Conference, April 1952. It contains an analysis of performance rating systems and various performance Rating Films from an MTM standpoint.

Simultaneous Motions (Report 105)

This report represents almost two man-years' work on a study of Simultaneous Motions. It is a final report of the Simultaneous Motions project undertaken by the MTM Association. While it does not purport to provide complete and exhaustive answers to all problems in the field of Simultaneous Motions, it presents a great deal of new and valuable information which should be of interest to every MTM practitioner.

Short Reaches and Moves (Report 106)

This report contains an analysis of the characteristics of Reaches and Moves at very short distances. It develops important conclusions concerning the application of MTM to operations involving these short distance elements.

Research Methods Manual (Report 107)